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ABSTRACT

The information technology/information systems (IT/IS) education sector needs to come up with creative ways of thinking about on-line education. In this paper, the major themes in the literature on on-line education to date are highlighted with a view to identifying issues that are either missing or under-emphasized. Next, the "radical model of on-line teaching" is presented. The paper concludes with a discussion of how the model addresses some of the issues that are missing or under-emphasised in the literature. Discussion includes the advantages and disadvantages of teaching on-line; the range of technologies for on-line teaching; the profound changes to the role of the lecturer as a result of on-line teaching; an under-emphasis on the soft knowledge/skills; a relevant underemphasis on the "Many to Many" mode of student/lecturer interaction; an under-emphasis on flexibility for the lecturer; and reasons for the need to be creative about on-line education. (Contains 9 references.) (Author/AEF)

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THE RADICAL MODEL — A PAINLESS WAY TO TEACH ON-LINE

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ABSTRACT

The IT/IS education sector needs to come up with creative ways of thinking about on-line education. In this paper, the major themes in the literature on on-line education to date are highlighted with a view to identifying issues that are either missing or under-emphasised. Next, the "radical model of on-line teaching" is presented. The paper is concluded with a discussion of how the model addresses some of the issues that are missing or under-emphasised in the literature.

INTRODUCTION

On-line education can be defined as teaching and learning activities enabled by electronic media. Given its reliance on emerging technologies, it is a relatively new area of research and practice for IT/IS educators. At the same time, the unique expertise that IT/IS educators have and the crucial importance of this area for the higher education sector in general, creates a situation where in many universities IT/IS academics are called upon to lead the transition of their universities to on-line education.

As part of this new role, it is also IT/IS educators who are expected to champion on-line teaching by being the first to use it in their own teaching. It is expected that based on their personal experience with this teaching mode, they will be able to disseminate knowledge about it to their less computer literate colleagues. It is also expected that based on their experiences as early adaptors and champions of this practice, they would be able to teach the rest of the academic sector how to do on-line teaching painlessly and more effectively.

It is for this reason that the IT/IS education sector needs to come up with creative ways of thinking about on-line education. Doing so will not only improve our own practices but help us enlighten others within the higher education sector on how to avoid our mistakes.

WHAT ARE THE MAJOR EMPHASES IN THE CURRENT LITERATURE ON ON-LINE TEACHING AND LEARNING?

The literature on on-line education to date seems to emphasise a number of themes:

The Advantages and Disadvantages of Teaching On-line

A major theme in the literature on on-line education is the advantages and disadvantages of this practice. Cost effectiveness and flexibility, particularly for students, are often mentioned as the major advantages of on-line teaching (West, 1998; Cunningham, 1998). While, "second rate" education and extra work for the lecturer are mentioned as the major disadvantage (Cunningham, 1998). There is general agreement in the literature, however, that no matter what the disadvantages are, the

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cost-effectiveness of on-line education is so compelling that it is bound to be the way of the future for universities (Cunningham, 1998; Ryan, 1998; Flew, 1998; Thomas, Meredyth, and Blackwood, 1998 and others).

The Range of Technologies for On-line Teaching

Another important theme in the literature on on-line education is a discussion of the ways in which it can be accomplished. In particular, the publications in this area contain descriptions of teaching situations (quite often borrowed from the face-to-face mode) that lend themselves to the on-line mode. For example, lecture notes can be placed on the class web site (just like distribution of these notes to the students in the face-to-face mode), students can submit assignments and be tested on-line, on-line multimedia packages can be developed to guide students through the major components of a subject area (e.g., teach students how to use a software). There is also emerging literature on how video and audio conferencing can support teaching and learning and some literature on how chat groups can be used to support teaching or as the basis for class interaction (West, 1998; Ryan, 1998; Cunningham, Tapsall, Ryan, Stedman, Bagdon, and Flew, 1998; Kelly and Shing Ha, 1998; Tsang and Fong, 1998).

The Profound Changes to the Role of the Lecturer as a Result of On-line Teaching

It is implied in the literature that on-line teaching heralds a new role for academics, with a stronger emphasis on the lecturer as provider of mass education and a lesser emphasis on his/her role as creator of new knowledge or as a researcher. This theme often leads to the conclusion that in the future academics will be expected to engage in less research and more teaching.

WHAT IS MISSING IN THE CURRENT LITERATURE?

A careful reading of the literature in this area seems to suggest that several themes are either missing or under emphasised in this literature. These themes include:

A Relative Under-emphasis on the "Many to Many" Mode of Student/lecturer Interaction

The discussion of on-line learning seems to suggest three modes of interaction between lecturer and students which are mutually exclusive:

"One to one". When students are reading materials on the class web site, getting assessed on line or working with an on-line tutoring package, they are basically interacting with the material on a one to one basis.

"One to many". When students are in an audio or video conferencing situation, as well as when they communicate directly with the lecturer through the telephone, or perhaps when they read materials that are updated occasionally by the lecturer on the class web site, they can be said to interact in a "many to one" or "one to many" mode.

"Many to many". When students are involved in discussion with other students as part of the class regular interaction or as an activity that is supporting the learning process, it would be an example of the "many to many" mode of interaction.

In contrast to the first two modes of on-line interaction, the "one to one" and "one to many", that seem to be predominant in the current literature on teaching on-line, the third mode, the "many to many", is not as frequently practiced as part on-line teaching. Even when this mode is practiced, it is more than likely to be seen as a parallel process to the **real** teaching, intended to "keep the students motivated". Thus, when the "many to many" mode is practiced it is not used as a teaching activity on its own (where students present their work, comment on other people's work, and get their work assessed on line) but rather as an enhancement of the real teaching, which takes place in the "one to one" or "one to many" mode.

An Under-emphasis on the Soft Knowledge/Skills

A study (Lee, Trauth and Farwell, 1995) based on combined input from industry and academia, concluded that four major clusters of knowledge/skills will be required of IS personnel in the next few years:

1) *Technical Specialties Knowledge/Skills*: including: operating systems, programming languages, database management systems, networks, telecommunications, etc.

2) *Technology Management Knowledge/Skills*: including issues such as where and how to deploy information technologies effectively and profitably for meeting strategic business objectives.

3) *Business Functional Knowledge/Skills*: including how to re-engineer business processes before the

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adoption of a new information system to produce maximum benefit from the system.

4) *Interpersonal and Management Knowledge/Skills*: which relates to the "boundary-spanning" role of information systems personnel. This role requires IS professionals to master interpersonal skills such as "selling," "negotiating," "leading," and "counselling."

It is worth noting that three of the four knowledge/skills clusters identified by Lee et al, namely, technology management, business knowledge, and interpersonal skills are not the "hard skills" traditionally associated with IT/IS education. These three clusters can be described as "soft" because they emphasise an understanding and ability to work with people rather than machines. The authors also report that while business managers are reasonably satisfied with the skills that IS graduates have in the "hard" areas, they are dissatisfied with the students' knowledge and ability to apply the soft skills. They conclude that it is the soft skills that need more attention from IS educators.

Given the importance of soft skills in IS education, the question arises how can they be most effectively taught? Given that these skills are related to interpersonal interaction, it would seem logical that the best way to teach them if not face-to-face, would be through the many to many mode. Obviously, the overemphasis on the one to one and one to many mode of interaction in the on-line teaching practice results in an over-emphasis on hard skills and under-emphasis on the soft skills needed by IS/IT professionals.

An Under-emphasis on Flexibility for the Lecturer

Much of the current discussion about on-line learning and teaching emphasises the flexibility that results from this mode of learning to students. Students are supposed to be able to learn any time, and anywhere (as long as they have access to the Internet). They are supposed to be able to not purchase books (if the course materials are available for them on the class Web site) or other teaching materials. Given the cheaper price of on-line education, it is supposed to be available to all students, irrespective of income, socio-economic level, gender, family status, or professional activities. In fact, the general assumption is that on-line education would make it possible for full time employees to do their studies "flexibly" in between all their other daily activities without major investment in either time or energy.

In contrast to the above, there is almost a universal agreement in the literature, that on-line teaching results in less flexibility and more work for lecturers. In fact it would be true to say that the increased flexibility for the learner is seen as associated with a decrease in flexibility for the lecturer. It is precisely for this reason that on-line teaching, as a major new activity for lecturers, is associated with the belief that academics in future will be disseminators of knowledge (teachers) rather than creators of knowledge (researchers).

WHY DO WE NEED TO BE CREATIVE ABOUT ON-LINE EDUCATION?

If we are to think creatively about on-line teaching and learning, we would have to address the three issues, outlined above, that are currently missing from much of the thinking in this area. In other words, our future on-line teaching models should incorporate ALL modes of interaction (including the "many to many"), ALL knowledge/skills clusters (including the soft skills) and the interests of both lecturers and students. If this new education practice is to succeed, it would have to be cost effective to both lecturers and students. It will also have to be inherently motivating to both students and lecturers, and organisationally viable.

There are obviously different ways to reach this goal. In the following sections an approach to on-line education that is currently practiced by some faculty in the Faculty of Informatics and Communication is presented. This model has been used with a range of courses, including small post-graduate courses (with up to 20 students) and large under-graduate courses (with up to 100 students). The students are a combination of on-campus and distant learners. Both groups are treated as one homogenous group, which means that the course does not have any face-to-face teaching.

To date, this model has been used to teach courses in Management of Information Systems and Electronic Commerce. Student responses to this model have been so positive that even though the thinking about it is still evolving, the authors believe that it is ready to be shared with others.

The "Radical" On-line Teaching and Learning Model

The teaching materials for the Radical Model of On-line Teaching (irrespective of what area is being taught) include:

- a video which contains detailed explanations from me on how the course is run;
- a ten-page booklet "Course Outline" which describes all necessary infomation about the course(it is available on line as part of the course's Web site and is provided to the students on a CD ROM and on hard copy);
- a textbook; and
- a class e-mail list.

The first thing that students are expected to do once they read the Course Outline and watch the video is subscribe to the class e-mail list. They are then expected to introduce themselves to the class on-line so they can be divided into weekly presentation groups. The allocation to groups is completed by the second week of the semester. By this time, students are expected to establish contact with their virtual group members and start working on their assessment tasks. On week 3 of the semester, the first group makes its presentation to the class on-line. The presentation consists of an article (which the students have to enclose, attach, or simply establish a hiper-link to) and a critique that links the article with the reading in the book for the week.

The presentation is expected to be made on Tuesday of each week. By Friday, each of the groups in the class is supposed to comment on the presentation. On Sunday, the presentations for the week are read by the instructor along with the comments that were made by all the groups. All groups are marked every week for either their presentation or their comments about other students' presentations. This procedure is repeated for ten weeks until the end of the semester, with each week dedicated to an in-depth discussion on a **different** topic that is related to the reading for that week.

What Are the Advantages of this Approach and Why It Should Be Considered Radical

This approach encompasses the best of all three modes of student/teacher interaction. Students have some interaction with the material (when they read the book and the articles that are presented by the other groups). They have some interaction with the lecturer, through direct correspondence on e-mail and the replies to them about their presentations on the class list. However, the major bulk of their interactions is in the "many to many" mode, with the other students in their presentation groups and with the rest of the students in the class through the class e-mail list.

Throughout the semester, students are assessed on 11 assessment tasks (including their group presentation, comments on other students' presentations and an end of term exam). For each presentation that they make, they get (if the class consists of 100 students) 19 comments which represent the views of their own group members (in this case, there will be 10 members per group) as well as all other 90 students in the class. Since this procedure is repeated every week, the students receive over 100 inputs from their group members, the other groups, and from the lecturer by the end of the semester.

It should be noted that even though class interaction is the means through which teaching takes place, the radical model does not result in the list being flooded by e-mail messages. Students are instructed to refrain from using the class list for unlimited expression. The place for such interaction is supposed to be the small presentation groups which they establish to support their group work. The messages that end up being posted on the class list are messages from the list moderator (the lecturer) "formal" presentations of the students' work, and comments by the other groups about these presentations.

This approach encompasses both hard and soft knowledge/skills. In addition to learning about the content area for the semester, students learn important on-line skills such as how to set up their e-mail lists, how to be citizens of an on-line community, and how to contribute to a virtual team, including dividing the work between the team members, resolving conflicts, developing ideas and projects, and providing positive feedback to others about their work.

Through the involvement of students from diverse backgrounds (many of whom are fully employed) students learn about how organizations use the abstract concepts that are mentioned in the readings. They also learn about relevant legislation and ethical issues.

This approach is flexible for both lecturer and student. The flexibility to the students, which has been discussed before, is increased in this approach because the students don't have to submit hard copy assignments (hence, nothing can get lost through the system). They get to know if their submission was successful immediately when they see it posted on the class list. As well as this, if something happens to preclude an

individual student's contribution during the semester, he or she can negotiate with their group members on how they can take time off and compensate later by doing more work for the group. In fact, students don't need to ever negotiate with the lecturer on late submission, special consideration, etc. All negotiations on these issues are carried out within the group.

Students have further flexibility in not having to download large amounts of data from the class Web site (there is nothing on the web site other than the Course Outline). They don't need to buy any books other than the course textbook, and even this book can be shared between them up until the end of the semester, as all assessment tasks are group based. Because all learning is facilitated by the class list, the students can engage in class activities from home, work, or while travelling. Further flexibility to the students is provided through the students' selection of supplementary readings for class discussion by **themselves**. As a result, students get to read quite a large number of articles on topical issues that are of interest to them rather than forced to read articles selected by the instructor.

Lecturer flexibility is also an enormous benefit from the radical model. Since the package for this course does not include a Study Guide, there is no need to update one every semester. Since the course is in no way dependent on a textbook, there is no need to modify or change it in any way if and when there is a need to change a textbook. In fact, preparing study materials for a new semester should not take more than a few minutes, given that nothing substantial has to change.

As for on-going teaching; reading the weekly presentation and the comments by the other groups (students are restricted to two pages or two screens maximum per critique or comment on other people's critique), takes about an hour and a half to two hours per week. This can be done from anywhere, including from home or from a conference. Theoretically, even if the lecturer is totally incapacitated, another person can easily take over and do the on-going weekly assessment, without inconveniencing the students.

Note that this design is also advantageous from a legal perspective. Since articles by other authors are not used as part of the course Web site, there is no infringement on other people's copy-rights.

The most important aspect about this model is that no matter how many students are in the class, the amount of work for the lecturer is the **same**. No matter how many students are in the class, 10 or 100, the lecturer ends up checking 10 presentations of one page each per week for ten weeks. If the class consists of 10 students, these 10 pages of text represent the work of each of them. If the class consists of 100 students, the ten pages will represent the work of the ten groups into which the students have been divided. Thus, the amount of marking for the lecturer remains the same, irrespective of the number of students in the class.

This approach can be enhanced by other means, of course;

1) class interaction can be supported by audio or video-conferencing (In this case differences in time-zones between different locations where students were located around the world prevented this application);

2) submissions can be made via the telephone (for example, students can tape role plays in a class on interpersonal communication and submit these to a voice mail box where they can be listened to and commented on by the other groups in the class);

3) class assessment can be complemented by on-line testing (this has not introduced so far in this situation);

4) teaching can be enhanced by on-line tutoring; and at least part of the interaction with the students can be undertaken through the class Web site, rather than on the class list.

Other improvements to this approach could involve a class management system which would allocate students to groups and establish group lists for them. Currently in the absence of such a system, the allocation of students to groups is conducted manually and students establish their groups on their own. It would seem that a class management system and/or the use of team teaching would be necessary once the number of students in a virtual class where this model is applied goes beyond 100. If this were to happen, the model could be easily duplicated, with more than one lecturer facilitating the learning process.

However, even without these enhancements, important lessons from use of the Radical Model are that this approach does not result in more work for the lecturer or in inferior education for the students. Student comments are very enthusiastic and they consider this format an

improvement over the usual hard copy distant education packages. They also consider it superior to many of their face-to face-courses, where the "one to many" or "one to one" modes are practised.

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